T/N 260
Filing Code 6721

Date Issued January 1975

TECHNICAL NOTE

U.S. DEPARTMENT OF THE INTERIOR – BUREAU OF LAND MANAGEMENT

WATERFOWL NESTING ISLAND DEVELOPMENT

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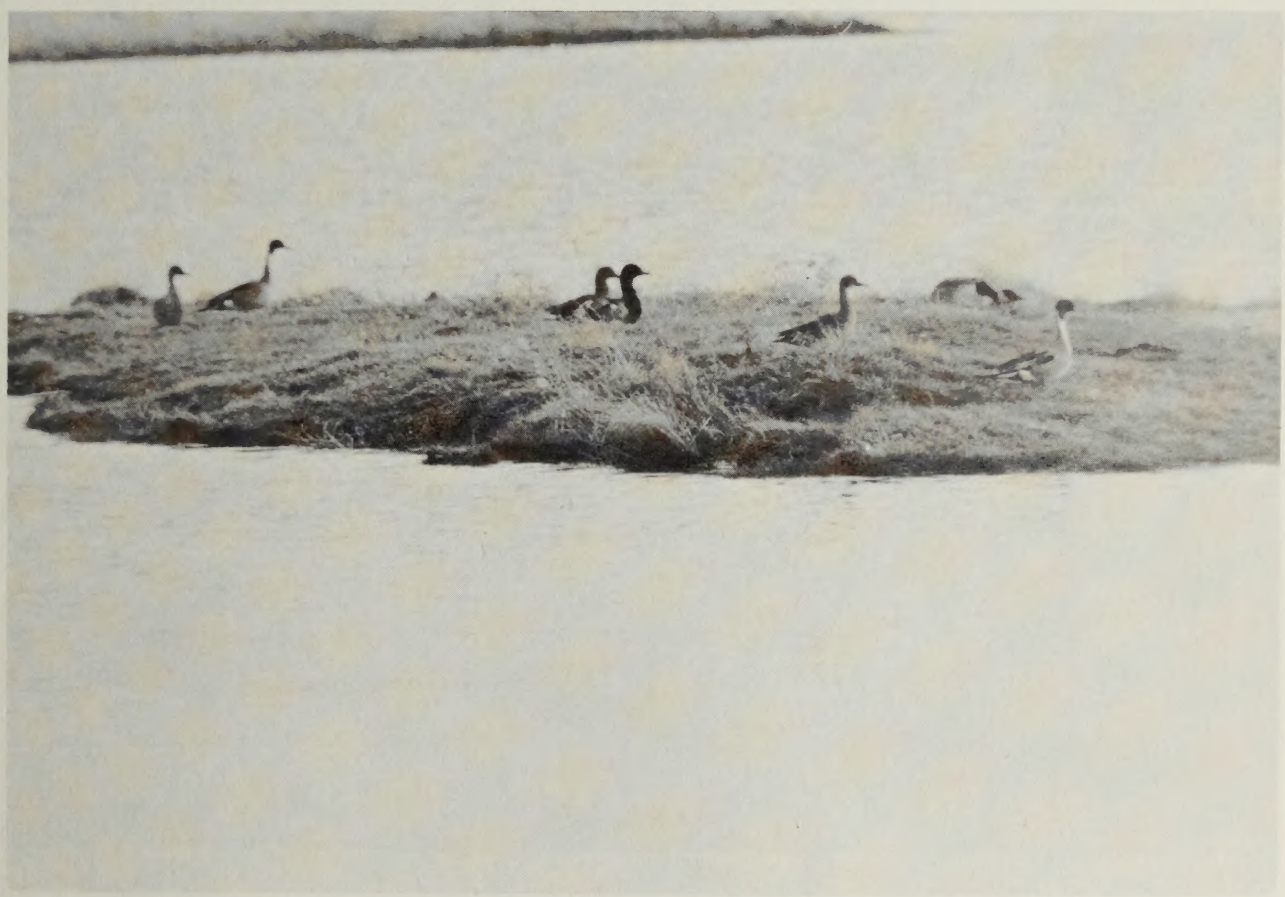

Illustration 1. Waterfowl nesting islands provide safe nesting sites for Canada geese and island nesting ducks

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I. INTRODUCTION

The creation of small islands in reservoirs provides an effective means of reducing terrestrial mammalian predation on waterfowl by providing inaccessible nesting sites near open water. (Illustration 1). These mammal-free sites increase nesting success and survival of island nesting species; e.g. Canada geese, mallards, lesser scaup, redhead, blue-winged teal, shovelers, pintails and gadwall. Increased nesting success on islands has been reported by various authors (including Keith, 1961; Duebbert, 1966; Hammond and Mann, 1956; Vermeer, 1970; Drewein, et al 1970; Atwater, 1959; Ellig, 1955; Hook, 1973; and McCarthy, 1973). Islands also assure adequate nesting cover in contrast to shorelines which may receive periodic close utilization and trampling of cover and nests by livestock (Gjersing, 1971). Nesting success comparisons as high as 90% for islands compared to 20% for mainland nesting is reported by various authors.

Island habitat possesses certain characteristies which are beneficial to nesting waterfowl including:

1. Increased security-level and higher nesting success is provided. Mammalian predation and human disturbance is suppressed on this isolated nesting site.

2. A greater shoreline-surface acre ratio is provided which encourages greater capacity for territorial occupancy by breeding waterfowl. Carrying capacity is largely a matter of adult breeding pair densities tolerated during the breeding months.

3. Provides brood-rearing security, loafing (or lookout) sites and feeding areas during the brood-rearing period.

4. Strong homing tendencies of waterfowl, especially the females, encourages future nesting where the females nested previously or were hatched themselves. As a result of this strong homing instinct, breeding pairs, especially Canada geese will return to natal areas and nest when they are approximately two years of age or in their third spring of life. The number of potential nesting birds is increased with the availability of suitable nesting habitat. (Illustration 2.)

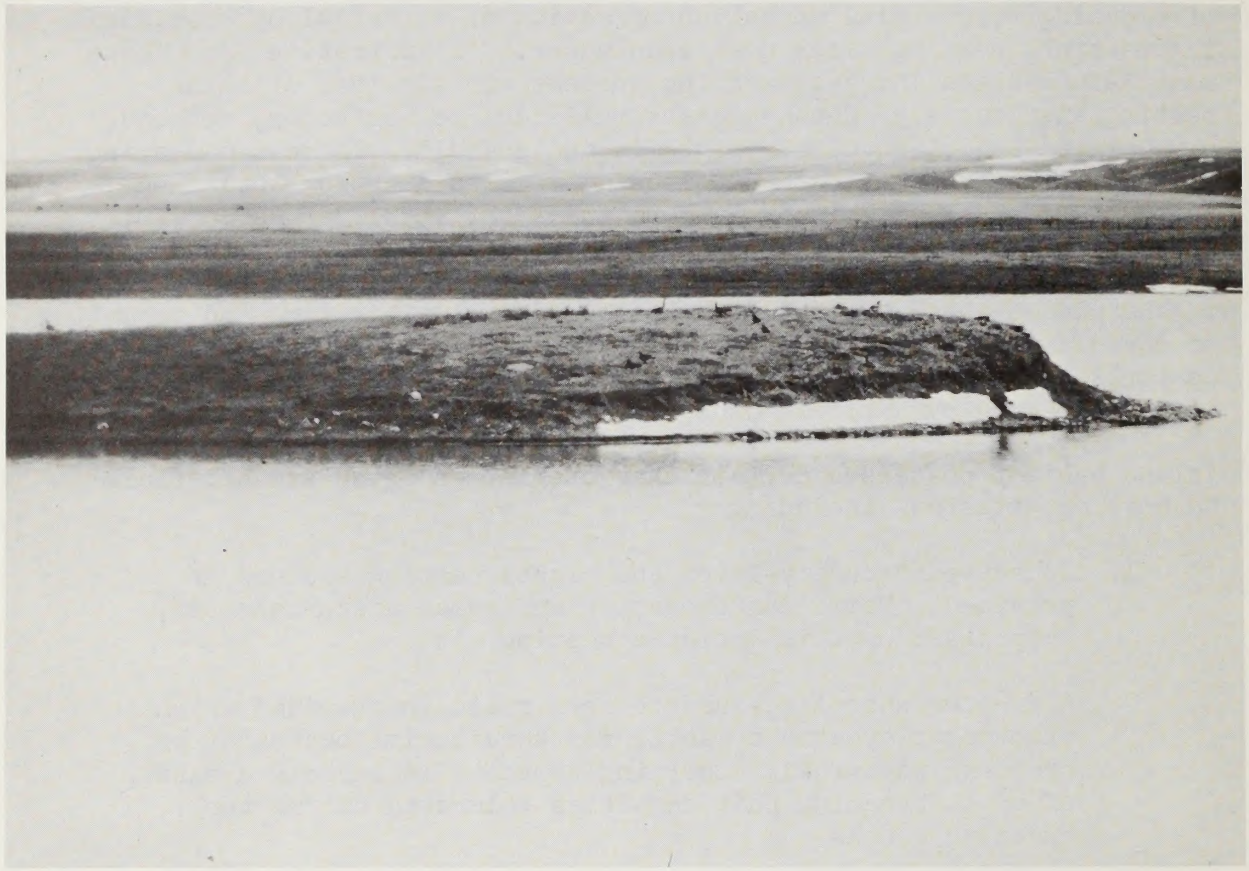

Illustration 2. Strong homing tendencies of waterfowl, especially the females, would increase the potential number of nesting birds using islands. Islands such as these are most easily and in-expensively constructed at the time of reservoir development.

II. BACKGROUND

Island modifications can be incorporated into new reservoir design and during maintenance jobs with minimal costs and effort. The creation of small retention type reservoirs in the semi-arid regions is creating waterfowl habitat. Island development can easily be accomplished on retention reservoirs greater than two surface acres with the aim of enhancing the habitat for increased waterfowl production, especially Canada geese and dabbling ducks. Nesting success is a factor limiting production in many areas. Nesting success can be increased measurably with the inclusion of small islands in the reservoir. The purpose of this Technical Note is to provide guidelines for island placement and development during new reservoir construction and during maintenance of existing reservoirs.

III. DEVELOPMENT METHODS

Small dirt mound islands (0.05 acre or greater) can be incorporated into new reservoir design and during maintenance jobs on existing reservoirs. Costs for new islands can be minimized if included as part of the new reservoir construction job.

Island opportunities are characterized by high points of ground which can be built up to form islands, tips or peninsula which can be pushed out and built up to form islands and delta areas (generally level ground on the upper end of the reservoir) where mounds can be pushed up with a bulldozer to form islands (Illustration 3). Dirt materials for islands are obtainable below the high-water line within the reservoir barrow areas.

Various types of equipment can be used to move these materials to form islands, such as a dragline ($\frac{1}{2}$-3/4 cu. yd. capacity) (Illustration 4), scrapers and bulldozer (Illustration 5).

Illustration 3. Dirt mound islands can be push up with a bulldozer during periods of low-water levels in existing reservoirs. Islands are most easily accomplished during reservoir construction with similiar equipment.

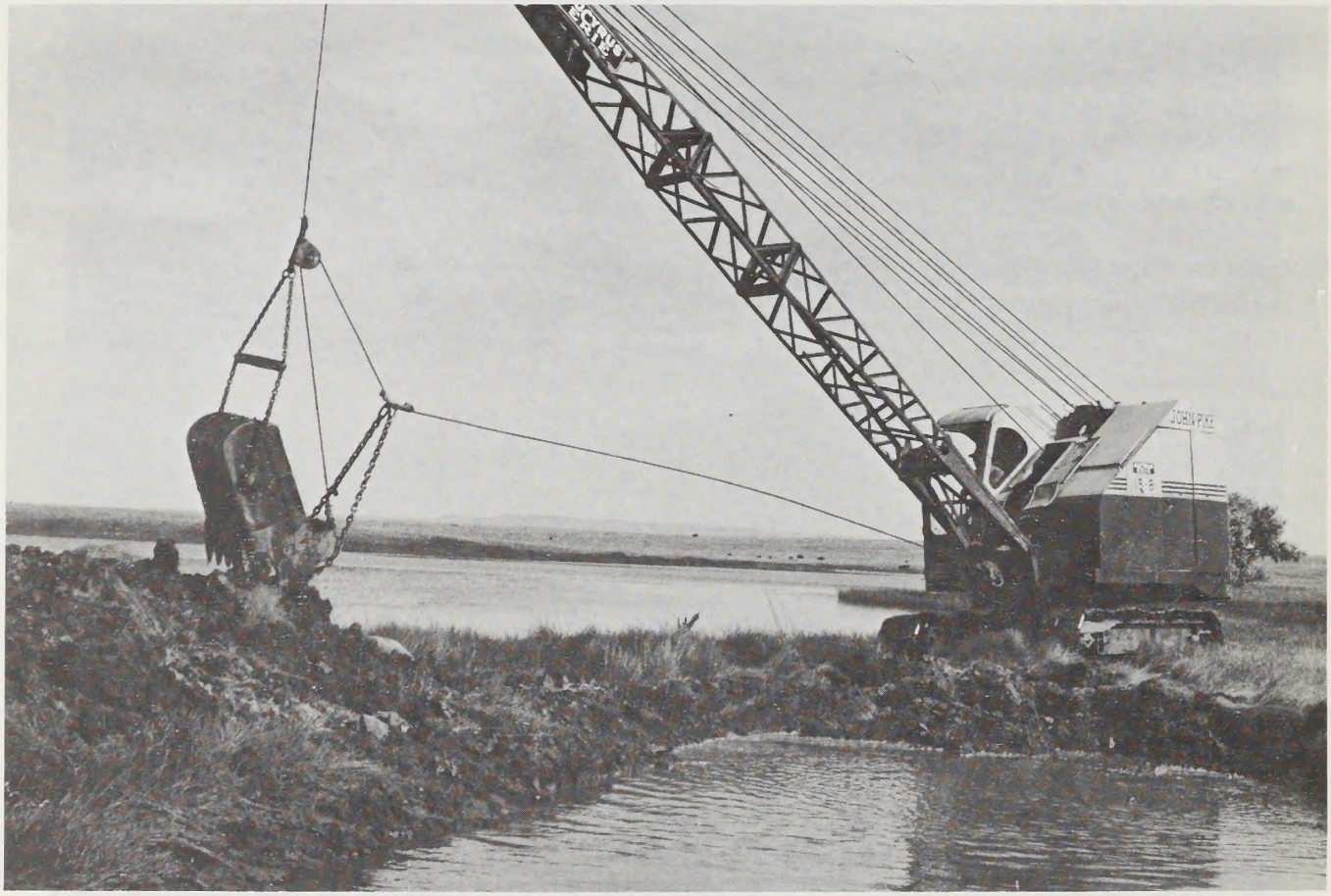

Illustration 4. Dragline reaching out from firm shoreline to construct island on tip which is being built-up with dirt materials obtained below the high water line.

Illustration 5. Bulldozer pushing up island during low-water level period.

Distance from the mainland will depend on each individual situation. Keith (1961) suggested channel depths of 1.5-2 feet deep and approximately 30 feet wide was adequate in southeastern Alberta. McCarthy (1973) recommended long, narrow push-up islands of 0.05 acre or greater at least 50 feet from and parallel to the shore for small retention reservoirs two surface acres or greater. Hook (1973) found a higher degree of use of islands by geese greater than 200 feet offshore on larger water areas. Islands developed as far from the shoreline and as near the center of the reservoir, spaced a minimum of 150 feet apart would be adequate to support nesting geese and minimize territorial strife.

Islands constructed during reservoir development could most advantageously be located nearer the center of the reservoir and costs would be minimized in comparision to future maintenance. Small islands (0.05 acre or greater) can be accomplished with a few hours of equipment rental time. (2 hours at $30/hr. or $60). Island compaction, resulting from heavy equipment travel and unloading, will result in a more compact, erosion-resistant island.

Late summer through early winter (Aug.-Dec.) will generally provide the best period to do island work on existing reservoirs. Water levels (generally recede by fall) and ground conditions will be more suitable to support the weight of heavy equipment. At this time of year, tips, peninsulas and delta areas are exposed and can be built up and separated from the mainland to form islands. This work can be accomplished most advantageously with some degree of frost in the ground.

Vegetative strippings should be spread on the top surface of the island(s) in order to encourage growth of vegetation for nesting cover, forage and to aid in stabilizing the island(s) against wave action. Grassland strippings are recommended. Strippings with woody growth should be avoided because of the growth tendency towards tall, rank vegetation which may limit the visibility by nesting birds and decrease use. In some instances, it may be desirable to reseed the island, especially on poorer soils. If reseeding is done, top soil should be used with a native grass species and a low growing legume. The ensuing growth would provide nesting cover until permanent vegetation becomes established.

The location of the island(s) relative to the prevailing wind direction must be considered on larger bodies of water (approximately 25 surface acres +). Islands should be located in a manner to avoid direct exposure to prevailing winds and to direct wave action. Islands located with this factor in mind will not be subject to erosion problems. A freeboard of at least three feet is recommended in order to avoid nest destruction due to periodic flooding and settling of the island.

IV. DEVELOPMENT COSTS

Island development costs will vary with the size of the island, rather new construction in conjunction with reservoir development or as a separate job element in conjunction with maintenance. Costs will also vary with the type of equipment used. Experience in northcentral Montana shows costs for individual islands varying from no additional expense to $150 for larger islands (0.5 acre). Average costs for small (0.05 acre) islands should be no more than $60. Substantial benefits exist from such an investment as use by nesting geese will likely occur within three years following construction (McCarthy, 1973) and the island should last the life period of the impoundment if properly located and designed. Homing tendencies of the birds, coupled with additional reservoir development, should attract use on a continual basis.

V. SUMMARY

Construction of small, adequately spaced nesting islands will enhance new and existing retention reservoirs for increased waterfowl production, especially Canada geese and dabbling ducks. Incorporating nesting islands into the design of artificial impoundments would serve to increase Canada goose populations on their breeding grounds. Use can be expected in proportion to the location of the development within the primary breeding range (BLM Manual 6601-1972), population densities and type of habitat where development is occurring. Costs are minimized if island placement and development is done at the time the reservoir is constructed. Islands can be developed during low-water level periods on existing reservoirs. A model island would include a channel depth of 1.5-2 feet, a long, narrow, island greater than 0.05 acres in size and placed parallel and at least 100 feet from the mainland. Native vegetative strippings would provide future cover and aid in stabilizing the island against wave action. The location in regard to the prevailing winds should be considered.

From the management perspective, there is an opportunity to increase and enhance the nesting habitat of waterfowl on the national resource lands by incorporating island development into the design of new impoundments and during maintenance jobs on existing impoundments as a management practice. (Illustration 6).

Illustration 6. These islands were built in early spring during low water with a dragline. Canada geese often nest on such islands the first year after construction, if available at the time breeding territories are selected.

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ILLUSTRATIONS

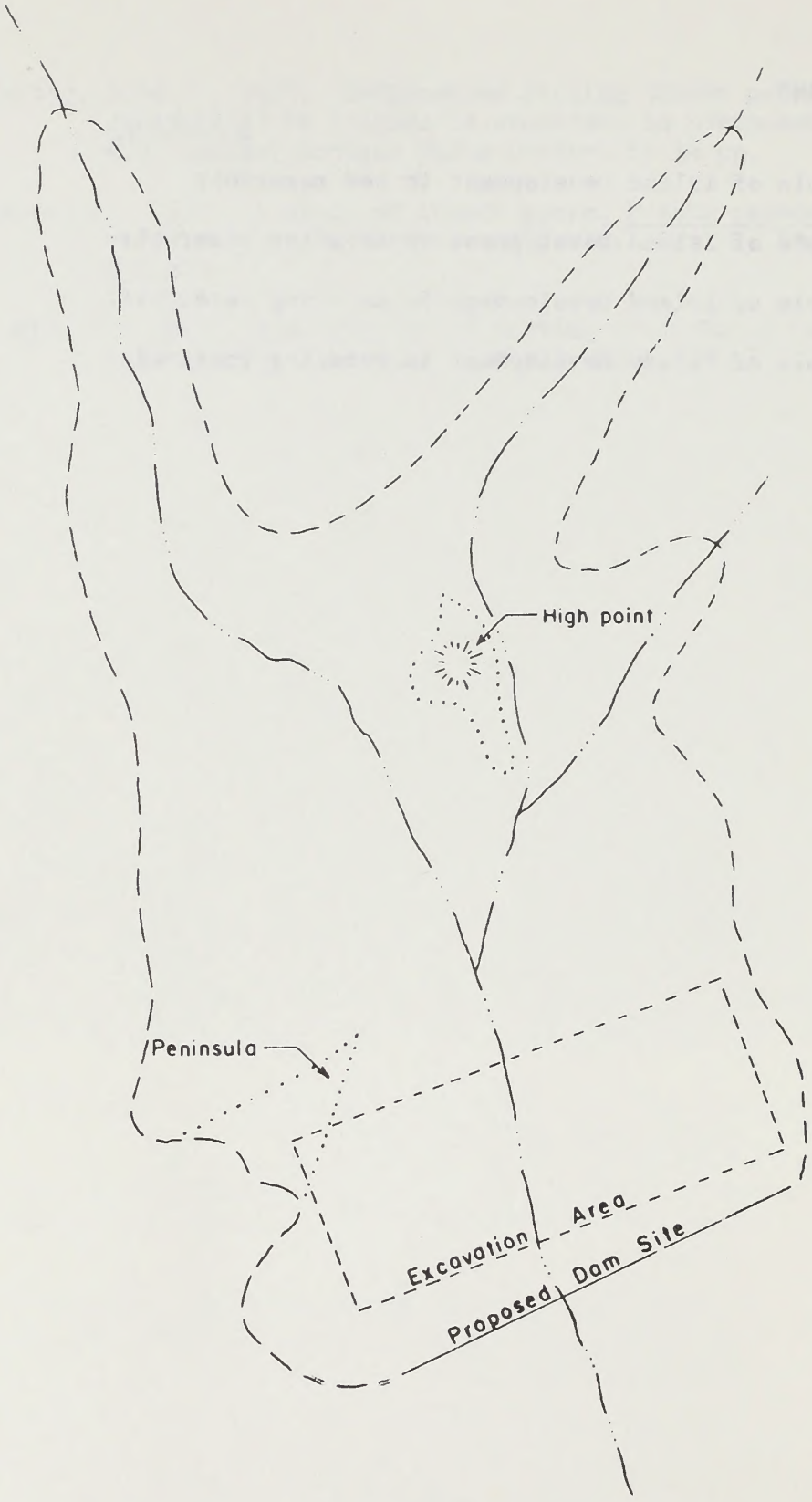

Illustration 7 - Example of Island Development in new reservoir.

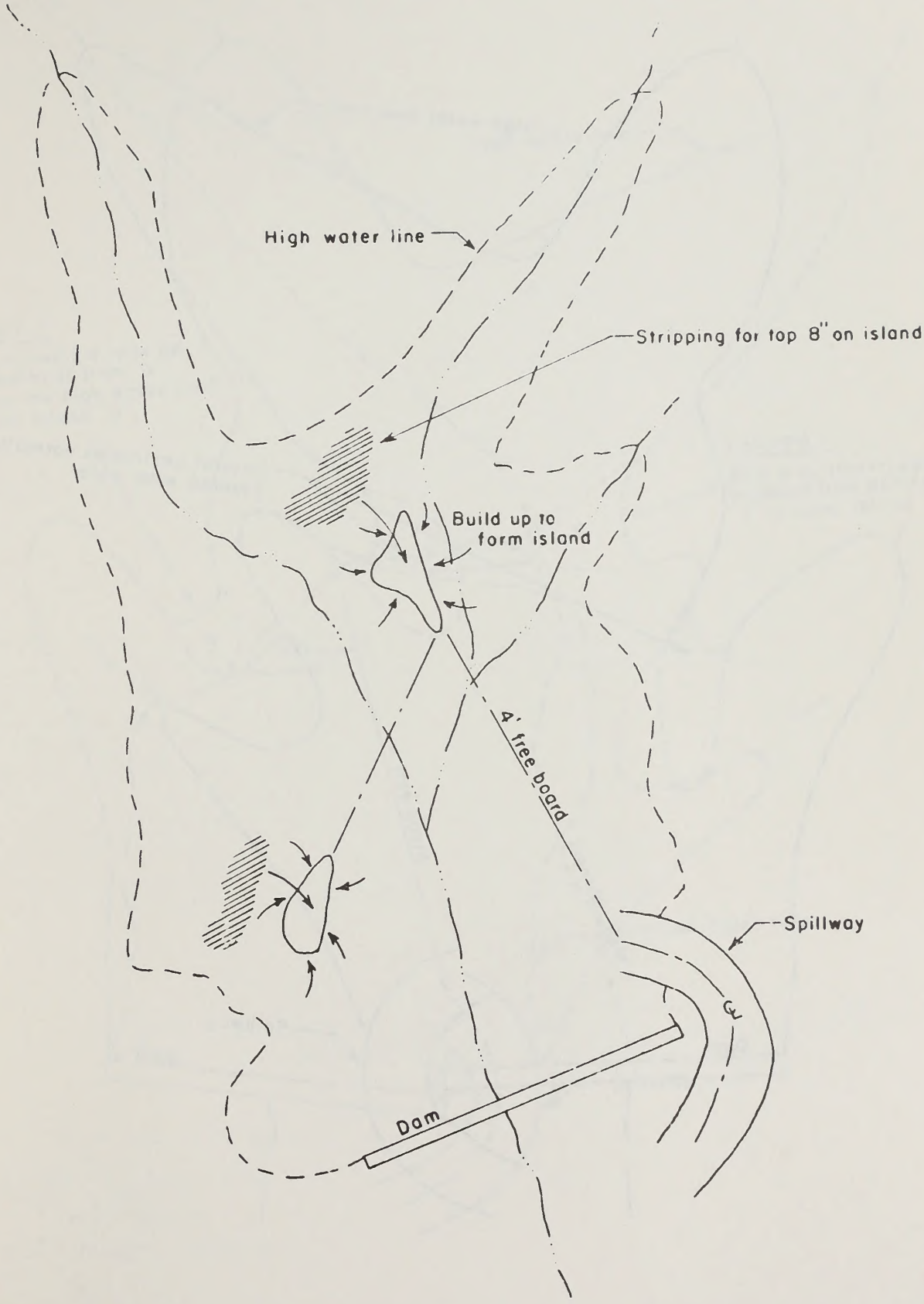

Illustration 8 - Example of Island Development in new reservoir.

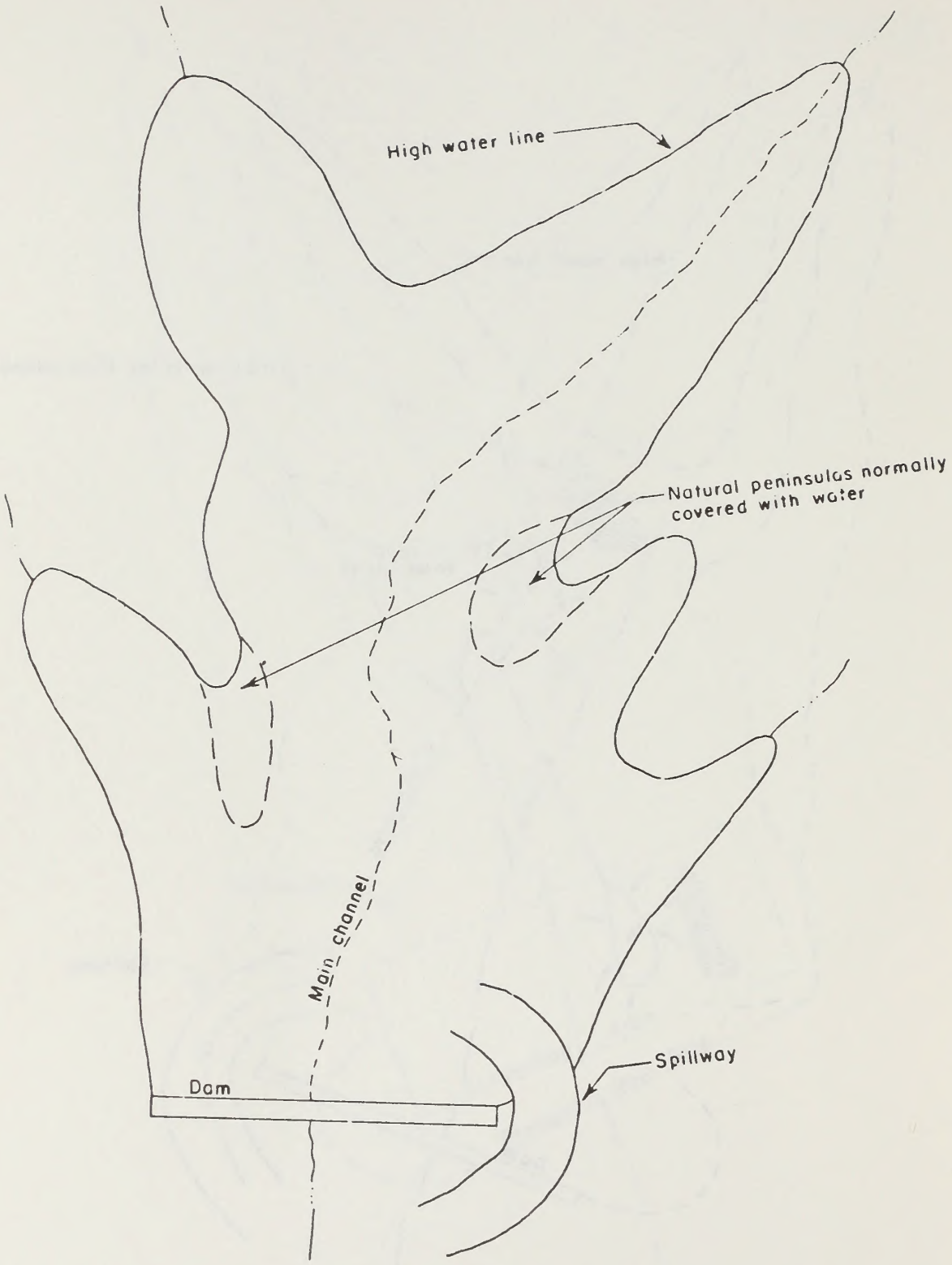

Illustration 9 - Example of Island Development in existing reservoir.

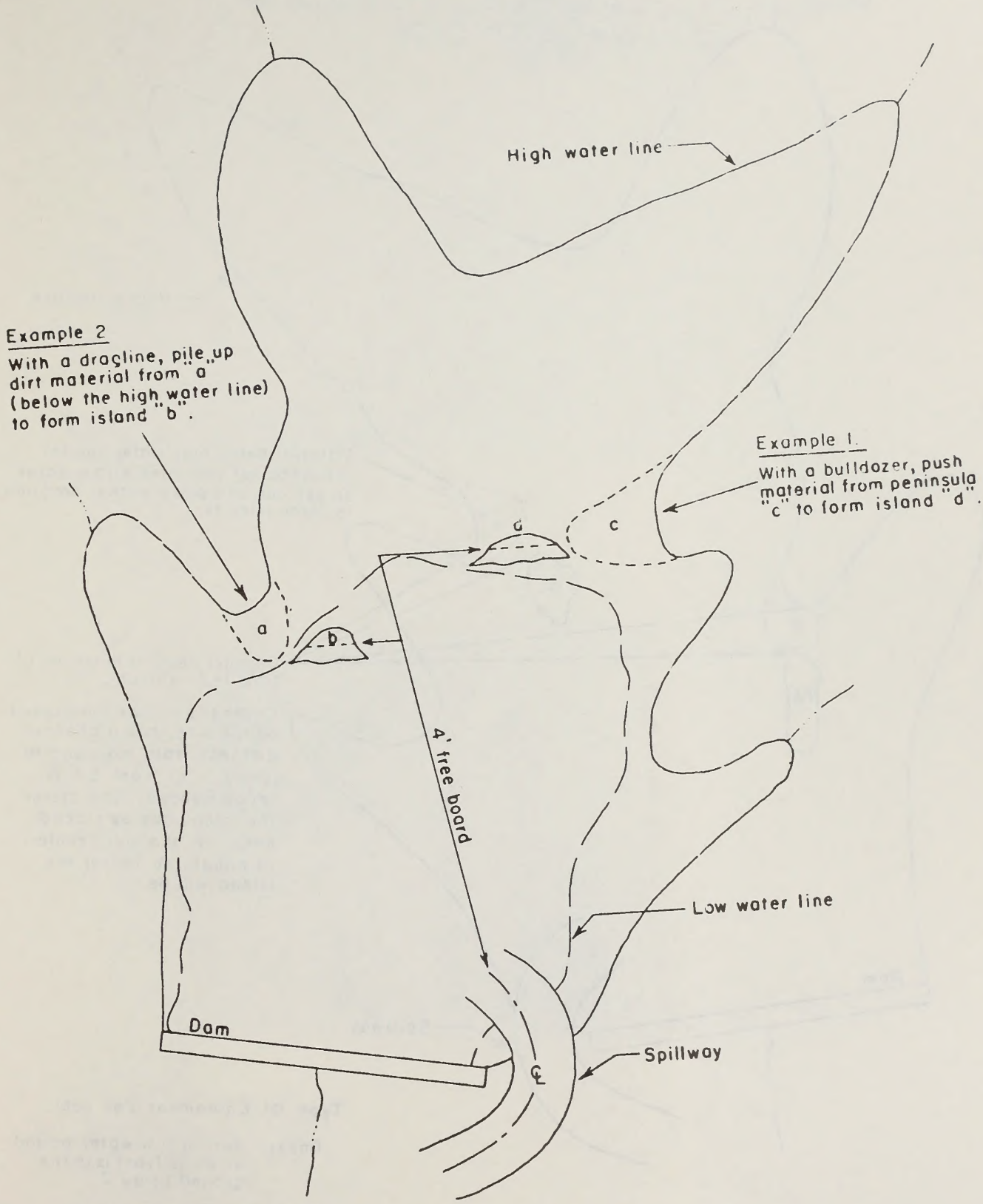

Illustration 10 - Example of Island Development in existing reservoir.

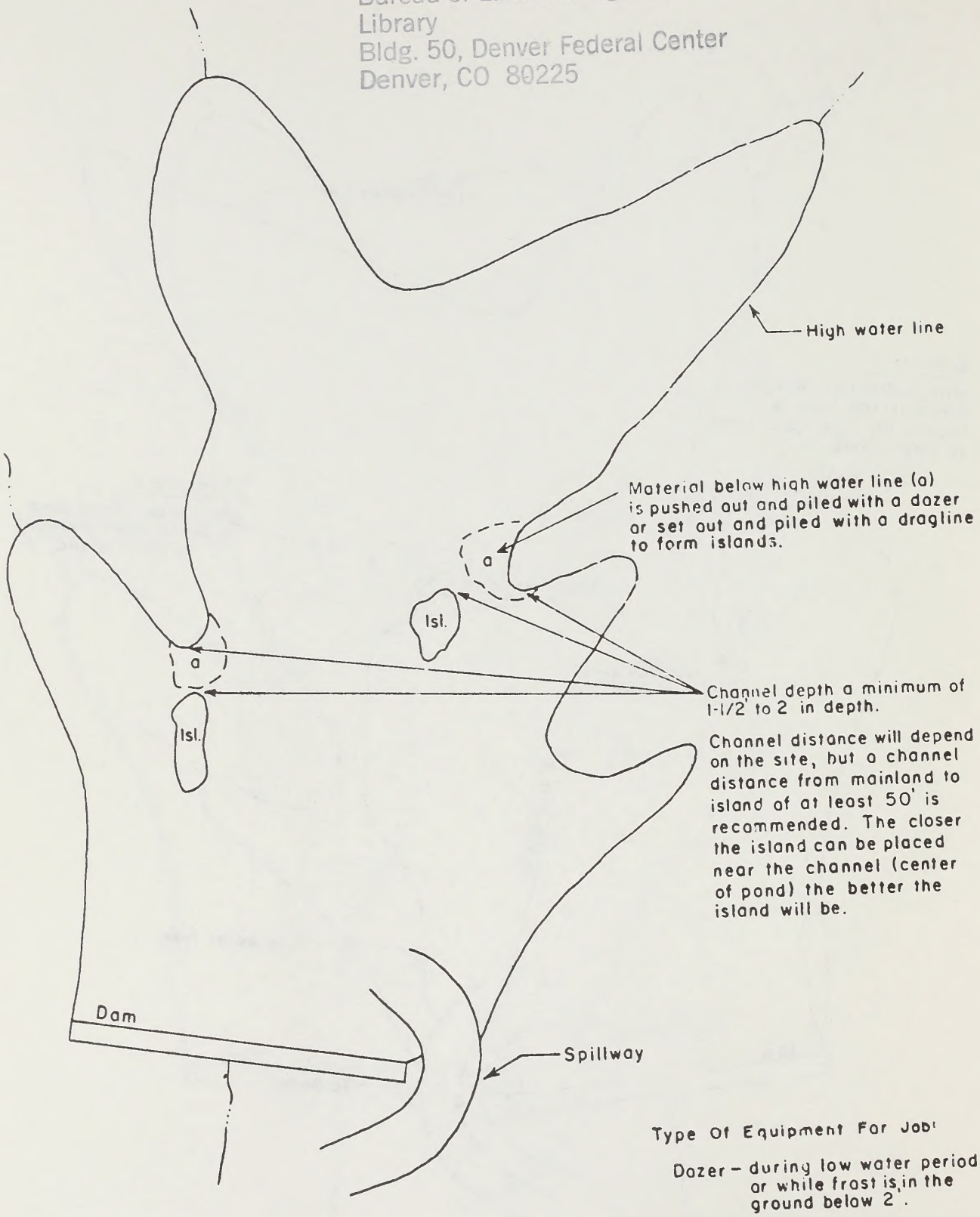

Illustration 11 - Example of Island Development in existing reservoir.

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